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BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

Application Number: 10/731,794
Filing Date: December 09, 2003
Appellant(s): WILLIAMS, GLENN D.

Daniel P. Dailey
For Appellant

EXAMINER'S ANSWER

This is in response to the appeal brief filed March 27, 2007 appealing from the Office action mailed August 14, 2006.

(1) Real Part in Interest

A statement identifying by name the real party in interest is contained in the brief.

(2) Related Appeals and Interferences

The examiner is not aware of any related appeals, interferences, or judicial proceedings which will directly affect or be directly affected by or have a bearing on the Board's decision in the pending appeal.

(3) Status of Claims

The statement of the status of claims contained in the brief is substantially correct. It is noted that claims 7-16 were previously canceled.

(4) Status of Amendments After Final

The appellant's statement of the status of amendments after final rejection contained in the brief is correct.

(5) Summary of Claimed Subject Matter

The summary of claimed subject matter contained in the brief is substantially correct. It is noted that claim 6 depends from claim 5 and not claim 1 as stated in the brief.

(6) Grounds of Rejection to be Reviewed on Appeal

The appellant's statement of the grounds of rejection to be reviewed on appeal is correct.

(7) Claims Appendix

The copy of the appealed claims contained in the Appendix to the brief is correct.

(8) Evidence Relied Upon

5,662,996	Jourquin et al.	09-1997
5,716,558	Nielsen et al.	02-1998
4,509,684	Schowiak	04-1985

(9) Grounds of Rejection

The following ground(s) of rejection are applicable to the appealed claims:

Claims 1-6 are rejected under 35 U.S.C. 103(a) as being unpatentable over Jourquin et al. (U.S. Patent 5,662,996) in view of Nielsen et al. (U.S. Patent 5,716,558).

Regarding claim 1, Jourquin et al. teach a method of forming a polyurethane skin for an interior part of a vehicle (col. 1, lines 7-12) comprising: providing an in-mold coating composition (col. 7, lines 19-34); spraying the in-mold coating composition toward a forming surface to create an in-mold coating layer (col. 7, lines 19-34; col. 3, lines 64-67); and applying a layer of polyurethane over the in-mold coating layer to form the polyurethane skin (col. 7, lines 31-57; col. 4, line 1). Jourquin et al. do not explicitly teach providing and utilizing an air assisted spray nozzle capable of delivering an atomizing air stream and heating the in-mold composition to a temperature above the ambient temperature.

However, Nielsen et al. teach an analogous method wherein they provide and utilize an air assisted spray nozzle capable of delivering an atomizing air stream and heating the in-mold composition to a temperature above the ambient temperature (col. 11, lines 62-66; col. 12, lines 9-31).

Therefore it would have been *prima facie* obvious to one having ordinary skill in the art at the time of the claimed invention to combine the teaching of Jourquin et al. with the air assisted spray nozzle method taught by Nielsen et al. for the purpose, as taught by Nielsen et al., of reducing drying time, reducing energy costs, increasing turbulent mixing to assist atomization, and to counteract the cooling affect of the compressed fluid (col. 1, lines 10-27; col. 1, lines 44-48; col. 11, lines 53-66; col. 12, lines 10-12).

As to claim 2, Nielsen et al. teach heating the atomizing air before it is provided to the nozzle to reduce the heating requirements on the system (col. 12, lines 10-12; col. 1, lines 20-27).

As to claims 3 and 4, Nielsen et al. teach heating the air stream between 30 °C (86 °F) and 90 °C (194 °F) (col. 12, lines 10-15).

As to claim 5, Jourquin et al. teach the layer of polyurethane is performed by spraying a layer of aromatic polyurethane over the in-mold coating layer after a flash/evaporation cycle (col. 4, lines 1-3; col. 7, lines 19-56).

As to claim 6, Nielsen et al. teach heating the composition of the coating mixture to a temperature that compensates for the drop in spray temperature (col. 2, lines 25-29) and suggests heating the liquid coating mixture to a temperature preferably less than 80 °C (176 °F) (col. 9, lines 64-67; col. 10. lines 1-22) prior to entry into the spray nozzle.

Claim 17 is rejected under 35 U.S.C. 103(a) as being unpatentable over Jourquin et al. (U.S. Patent 5,662,996) in view of Nielsen et al. (U.S. Patent 5,716,558) as applied to claims 1-6 above, and further in view of Schowiak (U.S. Patent 4,509,684).

As to claim 17, Jourquin et al. in view of Nielsen et al. teach the method of claim 1 as discussed in the 103(a) rejection above. Additionally, Jourquin et al. teach that a plurality of

different colors and materials may be employed in the method (col. 3, lines 57-67; Examples 2-5) and that those different colors and materials employ the same spray apparatus (4). Jourquin et al. do not explicitly teach the different colors are supplied from a color manifold.

However, Schowiak teaches an analogous method wherein the color for a spray operation is supplied through a color manifold (Abstract).

Therefore it would have been *prima facie* obvious to one of ordinary skill at the time of the claimed invention to employ a color manifold as taught by Schowiak in the method taught by Jourquin et al. for the purpose, as taught by Schowiak, of effecting rapid color change (Abstract).

(10) Response to Argument

Appellant's argument essentially alleges that neither Jourquin et al. nor Nielsen et al. teach providing an air assisted spray nozzle that delivers an atomizing air stream to spray a heated in-mold coating toward a forming surface. Appellant's argument also alleges there is no motivation to combine the teachings of Jourquin et al. and Nielsen et al. to arrive at the present invention and that Nielsen et al. teach away from an air assisted spray nozzle.

Regarding claim 6, appellant argues that neither Jourquin et al. nor Nielsen et al. teach or suggest heating the in-mold coating composition prior to entry into the spray nozzle.

A brief review of the applied references shows that:

Jourquin et al. teach a method for manufacturing a complete, self-supporting synthetic trim part for an automobile (Abstact; col. 1, lines 7-12). As a part of this method, Jourquin et al. teach forming a skin layer (5). One of the disclosed embodiments for forming the skin layer includes spraying a polyurethane paint/in-mold paint coating (col. 3, lines 42-66; col. 4, lines 49-

52) against the surface of the mold followed by applying/spraying a layer of polyurethane elastomer over the polyurethane in-mold paint coating after evaporation/flash of the solvent (Example 2; col. 7, lines 18-34).

Jourquin et al. further disclose spray application of additional layers of a polyurethane foam layer (6) and a polyurethane rigid carrier (8) upon the skin layer (5) to form the complete trim part. These additional steps/layers are of limited importance in the instant appeal since the claims are directed to the formation of the skin layer and do not require these additional steps/layers.

Jourquin et al. do not provide specific teaching regarding the type of spray gun/nozzle (4) employed. Jourquin et al. also do not teach the in-mold paint coating is heated above ambient temperature.

Nielsen et al. teach a method for spraying liquid compositions containing volatile solvents to form, among other things, powder coatings (Abstract). The liquid composition is mixed with a compressed fluid and it is the mixture of the liquid composition with the compressed fluid that is sprayed (col. 1, line 61 - col. 2, line 23). The most preferred compressed fluids are carbon dioxide and ethane (col. 2, lines 21-23). Carbon dioxide is exemplified throughout the disclosure.

The liquid composition and the compressed fluid (e.g. carbon dioxide) are formed as a mixture and the mixture is preferably heated to a temperature that substantially compensates for the drop in spray temperature that occurs due to expansion cooling of the decompressing compressed fluid and in order to increase the evaporation rate of the solvent from the spray (col. 2, lines 25-28; col. 5, lines 15-23; col. 9, line 64 - col. 10, line 44). Additionally, at least one compressed gas flow/jet is applied to the spray to further increase the rate of turbulent

mixing or the temperature of the spray or both (col. 2, lines 35-38) and to further increase the rate of solvent evaporation from the spray (col. 11, line 54 - col. 12, line 12). The additional gas flow/jet is disclosed as being ambient or heated air (Abstract; col.11, line 65 - col. 12, line 3; col. 12, lines 10-12).

One spray device employed by Nielsen et al. is an air assisted airless spray nozzle (col. 10, lines 45-50). Nielsen et al. state that assist gases typically have little or no effect on the atomization of a decompressive spray (col. 12, line 3-8) and further teach that the air in general assists in atomization (col. 11, lines 61-66) while specifically referring to the air in certain examples as "atomization assist air" and "atomization air" (col. 27, lines 9-27 and col. 27, lines 45-50).

Schowiak discloses an apparatus for rapid color changes of a multiple component sprayable fluid (Abstract). The Schowiak reference was applied to meet the limitations of dependent claim 17. The teachings of Schowiak have not been substantially argued by appellant in the brief.

A. Appellant argues that neither Jourquin et al. nor Nielsen et al. provide an air assisted spray nozzle capable of delivering an atomizing air stream.

This argument is not persuasive. As pointed out in the brief, the examiner admits that Jourquin et al. do not teach the argued limitation. However, as also pointed out in the brief, it is the examiner's position that Nielsen et al. do teach the argued limitation. The examiner notes the rejection is a combination rejection under 35 U.S.C 103(a).

Appellant argues distinctions between an "air-assisted airless spray nozzle" and an "air-assisted spray nozzle". The examiner notes that the alleged distinctions made in the brief (page

5, first full paragraph) regarding the structure of the nozzles, the locations from which the air is discharged from the nozzles, and the amount of air employed to assist with atomization, do not appear to be commensurate in scope with the appealed claims. Further, it is asserted by the examiner that the argued distinctions are not supported by a review of the instant specification and that the scope of the terms are not limited or defined by the instant specification. Claim 1 requires, "providing an air assisted spray nozzle capable of delivering an atomizing air stream". The examiner notes that Nielsen et al. provide air to assist with the spraying of liquid from a nozzle (Abstract; col. 11, line 61-col. 12, line 31; col. 27, lines 9-27). It is the examiner's position that this meets the requirement in the claim of "providing an air assisted spray nozzle" since air is used to assist the spray nozzle.

Regarding the second part of the argued limitation, "capable of delivering an atomizing air stream", the examiner notes as an initial matter that the claim does not positively require that an atomizing air stream be delivered, but that the nozzle must only be capable of delivering an atomizing air stream. However, it is the examiner's position that the limitation is met by Nielsen et al. whether the claim requires the nozzle only be capable of providing an atomizing air stream or whether the nozzle is actually required to deliver an atomizing air stream. For example, Nielsen et al. specifically state that they employ "atomization assist air" (col. 27, lines 9-27) and "atomization air" (col. 27, lines 45-50) and that assist gas used to "assist atomization" is typically compressed air (col. 11, lines 61-66).

Regarding the comment in Nielsen et al. that "assist gas jets typically have little or no effect on the atomization of a decompressive spray" (col. 12, lines 3-5) it is the examiner's position that this statement when taken with the full teaching of Nielsen et al. is best understood to suggest that the assist gas does not negatively impact the atomization of the decompressive spray (e.g. see col. 27, lines 9-27, showing improved performance when employing heated and

pressurized atomization assist air with carbon dioxide instead of using heated carbon dioxide alone with the liquid mixture). However, the examiner also notes that the statement recites "little...effect" and that the teachings at (col. 11, lines 61-66) and (col. 27, lines 9-27) clearly suggest, if not explicitly teach, that the atomization is effected by the compressed air.

B. Appellant argues there is no motivation to combine the teachings of Jourquin et al. with Nielsen et al. to arrive at the present invention.

This argument is not persuasive. Jourquin et al. spray a polyurethane in-mold paint coating (col. 3, lines 42-66; col. 4, lines 49-53) and disclose the polyurethane elastomer layer (5) is not added until after the solvent evaporates (col. 7, lines 31-34). Nielsen et al. teach a method of spraying liquid compositions, including polyurethane based coating materials (col. 3, lines 1-5), containing volatile solvents to form coating powders that allow spraying at higher solids levels (Abstract).

The examiner notes as an initial matter that spraying at higher solids levels as recited in Nielsen et al.'s abstract provides motivation to modify Jourquin et al. with Nielsen et al.

Further Nielsen et al. teach the practice of their method results in reduced energy costs (col. 4, line 66 – col. 5, line 5), high rates of solvent evaporation (col. 5, lines 15-22), and enhanced atomization (col. 10, lines 26-47; col. 12, lines 63-66) while also providing a means of increasing turbulent mixing to assist atomization and producing solid particulate more uniformly throughout the spray pattern at a shorter distance (col. 11, lines 54-66; col. 13, lines 43-47; col. 27, lines 9-27).

Appellant's argument appears to solely focus on the weaknesses of one of the reasons provided by the examiner in the response to arguments in the final rejection; namely, the linkage between water-borne compositions found in the two references. The examiner essentially

agrees with the statements made by the appellant noting that Jourquin et al. do not teach their in-mold coating is a water-borne composition. However, for the reasons provided above, it is the examiner's position that there remains ample motivation to modify the teaching of Jourquin et al. with the teaching of Nielsen et al. to arrive at the present invention and that this motivation is provided by the references themselves.

C. Appellant argues that Nielsen et al. teach away from using an air-assisted nozzle that delivers an atomizing air stream at col. 32, lines 37-65.

This argument is not persuasive. In the cited example, Nielsen et al. exemplify a method where the decompressive gas (e.g. carbon dioxide) is not used at all and that instead of the decompressive gas, air is used alone. Nielsen et al. state the results of this comparative example are not as good as when the method of their invention is employed. Appellant argues that this example teaches away from using an air assisted nozzle. The examiner disagrees.

The examiner points out that the teaching of Nielsen et al. is to use a decompressive gas (e.g. carbon dioxide) and an assist gas (e.g. air) together to deliver improved results. It is the examiner's position that an example by Nielsen et al. showing that the method of their instant invention (i.e. employing carbon dioxide and air assist together) performs better than using an air spray alone does not teach away from employing an air assisted spray nozzle.

The cited example in Nielsen et al. suggests nothing different than the rest of the Nielsen et al. reference; namely, employing the decompressive gas (e.g. carbon dioxide) and assist gas (e.g. air) together. The example merely supports what Nielsen et al. teach throughout the disclosure.

Furthermore, the examiner notes that the claim contains open "comprising" language and does not exclude using materials other than air as part of the spraying process. The use of

an assist gas (e.g. air) together with the decompressive gas (e.g. carbon dioxide) as disclosed by Nielsen et al. meets the claim limitation directed to providing an air assisted spray nozzle, since air is still used to assist the spray nozzle. At most, the teaching of Nielsen et al. found at col. 32, lines 37-65 teaches away from using air alone. However, the claim does not require air be used alone and Nielsen et al. clearly teach employing carbon dioxide and air together. As such, it is the examiner's position that Nielsen et al. do not teach away from using an air-assisted nozzle as alleged in the brief.

D. Appellant argues that, regarding claim 6, neither Jourquin et al. nor Nielsen et al. teach heating the in-mold coating composition prior to entry into the spray nozzle.

This argument is not persuasive. The examiner has not relied upon Jourquin et al. to teach the argued limitation. It is the examiner's position that Nielsen et al. do teach and/or suggest the argued limitation. The examiner notes the rejection is a combination rejection under 35 U.S.C 103(a).

Appellant argues that Nielsen et al. teach that the assist gas jets are used to heat the liquid mixture and further points out that the assist gas jets apply their assistance subsequent to entry of the coating composition into the spray nozzle. Appellant further points to the disclosure in the background of the invention where Nielsen et al. make a generic statement stating that a relatively small amount of heated gas locally may be applied instead of heating the entire spray chamber. With these two teachings, appellant concludes that Nielsen et al. do not teach heating the in-mold coating composition prior to entry into the spray nozzle. The examiner disagrees.

As an initial matter, the examiner notes that claim 6 does not require, nor does it appear to be argued, that air is used to heat the in-mold coating composition prior to entry into the spray

nozzle. The claim only requires that the in-mold coating composition be heated prior to entry into the spray nozzle.

The examiner again turns to Nielsen et al. and asserts that Nielsen et al. do not solely rely upon the assist gas jets to heat the liquid mixture. For instance, Nielsen et al. teach the liquid mixture is heated (col. 2, lines 25-28), that the assist gas can be at ambient temperature (Abstract) and that the assist gas can be used to increase the rate of turbulent mixing or the temperature within the spray or both (col. 2, lines 35-38, emphasis added).

Additionally, Nielsen et al. teach the spray temperature is most preferably below about 80 °C and most preferably above 50 °C (col. 9, line 64 - col. 10, line 7) and separately teach the assist jets may be heated to increase the temperature of the spray (col. 12, lines 10-15). Furthermore, Nielsen et al. exemplify a mixture containing carbon dioxide, without assist gas air, at 60 °C (col. 27, lines 9-13) and exemplify a mixture being recirculated in a loop containing two heaters prior to being sprayed through the spray nozzle (col. 25, lines 35-40) and therefore prior to being contacted by the assist gas jets.

From these citations in Nielsen et al., and when taking the teaching of Nielsen et al. as a whole, it is the examiner's position that the clear teaching and suggestion of Nielsen et al. is to heat the mixture prior to entry into the spray nozzle.

The teaching by Nielsen et al. of employing heated assist gas jets to contact the spray only further enhances the method of Nielsen et al. and does not teach or suggest that the sole means of heating the mixture is with the assist gas jet as the mixture leaves the nozzle as is apparently suggested in the argument to support a conclusion that the mixture is not heated prior to entry into the spray nozzle.

Regarding the citation at col. 1, lines 20-27, in the background of the invention section of the Nielsen et al. reference, the examiner notes that the generic statement directed to not

"heating an entire spray chamber" does not eliminate or override the clear, specific, and extensive teachings and suggestions found within Nielsen et al. regarding providing a heated mixture to the spray nozzle as set forth above.

(11) Related Proceeding(s) Appendix

No decision rendered by a court or the Board is identified by the examiner in the Related Appeals and Interferences section of this examiner's answer.

For the above reasons, it is believed that the rejections should be sustained.

Respectfully submitted,

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